Amendments to the Claims

Claims 1-28 **(canceled)**

29. (currently amended): A syringe assembly having a retractable needle and designed for one-time use, comprising:

a hollow syringe body comprising a barrel having a front end portion containing a retraction mechanism having a retractable needle, a needle holder having an inner head and a continuous retaining member configured for operation by forward movement of a plunger, and a back end portion having an opening;

the continuous retaining member surrounding the inner head of the needle holder and having ~~one~~ a surface mating with a facing surface of the hollow syringe body, thereby making a seal for a variable fluid chamber in the barrel;

a plunger having a front end portion comprising a head, an outer wall ~~a supporting~~ surface on the plunger front end portion having a plunger seal element fixed on the ~~supporting~~ outer wall surface, and a back end portion with an end cap having an outer periphery;

the plunger being reciprocally mounted in said barrel with the plunger seal element in sliding sealed contact with the barrel; and

the ~~retractable needle~~ retraction mechanism being released for retraction of the retractable needle when the plunger is moved forward to release the continuous retaining member, without ~~contact between the plunger seal element and the continuous retaining member and without relative movement between~~ moving the

plunger seal element ~~and its supporting~~ longitudinally along the outer wall surface by contact between the plunger seal element and the continuous retaining member.

the outer periphery of the plunger end cap being receivable into the opening in the back end portion of the hollow syringe body upon retraction.

30. (original): The assembly of claim 29 wherein a structure mounted in the front end portion of the barrel prevents forward motion of the retractable needle during retraction of the needle to prevent pain when the needle is retracted from a patient.

31. (previously presented): The assembly of claim 29 wherein the plunger carries a tip which protrudes to contact the continuous retaining member and release the retractable needle when retraction is initiated by pushing on the plunger.

32. (original): The assembly of claim 29 wherein the continuous retaining member is a separable part of the retraction mechanism which acts as a fluid seal for a variable chamber in the barrel behind the separable part.

33. (currently amended): The assembly of claim 31 wherein the continuous retaining member is separable from the ~~retractable~~ inner head of the needle holder when retraction is initiated by pushing on the plunger.

34. (currently amended): The assembly of claim 33 wherein the continuous retaining member is separated from the ~~retractable~~ inner head of the needle holder by means of force applied by said tip to said continuous retaining member when retraction is initiated by pushing on said plunger.

35. (canceled)

36. (previously presented): The assembly of claim 29 wherein the outer periphery of the plunger end cap is lodged in the opening of the back end portion of the hollow syringe body by pressing the end cap to cause retraction, whereby the plunger cannot be grasped after retraction.

37. (currently amended): A syringe assembly having a retractable needle and designed for one-time use, comprising:

a hollow syringe body comprising a barrel having a front end portion in which a retraction mechanism is mounted, the retraction mechanism having a retractable needle and a continuous retaining member which ~~holds~~ retains the retractable needle prior to retraction, and a back end portion having an opening;

a plunger having a front end portion comprising a head and ~~a supporting~~ an outer wall surface located on the front end portion, with a plunger seal element fixed on the ~~supporting~~ outer wall surface, and a back end portion with an end cap having an

outer periphery, the retraction mechanism being operable by forward movement of the plunger without distorting the barrel;

the plunger being reciprocally mounted in said barrel with the plunger seal element in sliding sealed contact with the barrel; whereby

forward movement of the plunger releases the retractable needle from the continuous retaining member by applying a separating force to the continuous retaining member, without the aid of the plunger seal element and without ~~relative movement between~~ moving the plunger seal element ~~and its supporting~~ longitudinally along the outer wall surface;

the outer periphery of the plunger end cap being receivable into the opening in the back end portion of the hollow syringe body upon retraction.

38. (previously presented): The assembly of claim 37 wherein the continuous retaining member acts as a fixed seal for a variable chamber in the barrel behind the continuous retaining member.

39. (currently amended): The assembly of claim 38 wherein a structure mounted in the front end portion of the barrel prevents forward motion of the retractable needle during retraction of the retractable needle to prevent pain when the retractable needle is retracted from a patient.

40. (currently amended): The assembly of claim 37 wherein the continuous retaining member ~~is separable from~~ releases the retractable needle when retraction is initiated by pushing the plunger to move it forward with respect to the barrel.

41. (previously presented): The assembly of claim 40 wherein the plunger carries a tip which protrudes to contact the continuous retaining member and release the retractable needle when retraction is initiated by pushing on the plunger.

42. (currently amended): The assembly of claim 41 wherein the continuous retaining member ~~is separated from~~ releases the retractable needle by means of force applied by said tip to said continuous retaining member when retraction is initiated by pushing on said plunger.

43. (canceled)

44. (previously presented): The assembly of claim 37 wherein the outer periphery of the plunger end cap is lodged in the opening of the back end portion of the hollow syringe body by pressing the end cap to cause retraction, whereby the plunger cannot be grasped after retraction.

45. (currently amended): A syringe assembly ~~having a retractable needle and~~ designed for one-time use, comprising:

a hollow syringe body comprising a barrel having a front end portion in which a retraction mechanism is mounted, the retraction mechanism having a retractable needle ~~which is~~, a continuous retaining member that retains the retractable needle prior to retraction, and a back end portion having an opening;

the continuous retaining member having ~~one mating~~ a surface mating with a facing surface of the hollow syringe body, thereby making a seal for a variable fluid chamber in the barrel;

a plunger having a front end portion comprising a head and ~~a supporting~~ an outer wall surface located on the front end portion, a plunger seal element fixed on the ~~supporting~~ outer wall surface, and a back end portion having an outer periphery;

the plunger being reciprocally mounted in said barrel with the plunger seal element in sliding sealed contact with the barrel; and

the ~~retractable needle~~ retraction mechanism being released for retraction when the plunger is moved forward to release the continuous retaining member, without the plunger seal element going beyond said ~~one~~ outside ~~mating~~ surface of the continuous retaining member and without ~~motion of~~ moving the plunger seal element ~~relative to its supporting~~ longitudinally along the outer wall surface;

the outer periphery of the plunger back end portion being receivable into the back of the hollow syringe body upon retraction.

46. (previously presented): The assembly of claim 45 wherein the continuous retaining member acts as a fixed seal for a variable chamber in the barrel behind the continuous retaining member.

47. (currently amended): The assembly of claim 46 wherein a structure mounted in the front end portion of the barrel prevents forward motion of the retractable needle during retraction of the retractable needle to prevent pain when the retractable needle is retracted from a patient.

48. (original): The assembly of claim 45 wherein the continuous retaining member is separable from the retractable needle when retraction is initiated by pushing the plunger to move it forward with respect to the barrel.

49. (previously presented): The assembly of claim 48 wherein the plunger carries a tip which protrudes to contact the continuous retaining member and release the retractable needle when retraction is initiated by pushing on the plunger.

50. (previously presented): The assembly of claim 49 wherein the continuous retaining member is separated from the retractable needle by means of force applied by said tip to said continuous retaining member when retraction is initiated by pushing on said plunger.

51. (canceled)

52. (previously presented): The assembly of claim 45 wherein the outer periphery of the plunger back end portion is lodged in the back of the hollow syringe body by pressing the plunger end to cause retraction, whereby the plunger cannot be grasped after retraction.

53. (canceled)

54. (previously presented): A syringe assembly having a retractable needle and designed for one-time use, comprising:

a front end retraction mechanism having a retractable needle, a needle holder, a biasing element and a continuous retaining member;

a plunger having a front end portion comprising a head and ~~a supporting~~ an outer wall surface on the front end portion having a plunger seal element fixed on the ~~supporting~~ outer wall surface;

a rigid plunger seal element stop surface which acts as a plunger seal element stop;

wherein the needle holder has a front portion extending forwardly beyond the biasing element; and

wherein the retraction mechanism is operated by forward movement of the plunger to release the retractable needle for retraction while the plunger seal element

remains fixed to ~~its supporting~~ the outer wall surface.

55. (previously presented): The syringe assembly of claim 54 wherein the plunger operates the retraction mechanism by acting on the continuous retaining member to release the retractable needle for retraction while the plunger seal element remains fixed to ~~its supporting~~ the outer wall surface.

56. (previously presented): A syringe assembly having a retractable needle and designed for one-time use, comprising:

a hollow syringe body comprising a barrel having a front end portion containing a retraction mechanism having a retractable needle, a needle holder and a continuous retaining member configured for operation by forward movement of a plunger;

a biasing element mounted in the front of the barrel;

a plunger having a retraction cavity and a front end portion comprising a head having a reduced inside diameter relative to the retraction cavity and ~~a supporting~~ an outer wall surface on the front end portion with a plunger seal element fixed on the ~~supporting~~ outer wall surface, and an end cap with an outer periphery opposite the front end; and

the hollow syringe body further comprising a back end portion having an opening for receiving the outer periphery of the end cap.

57. (previously presented): The assembly of claim 56 wherein the outer periphery of the plunger end cap is lodged in the opening of the back end portion of the hollow syringe body by pressing the end cap to cause retraction, whereby the plunger cannot be grasped after retraction.

58. (currently amended): A syringe having a hollow body with first and second open ends and an inside wall of varying inside diameter extending between the first and second open ends, a needle retraction mechanism insertable into the body through the second open end, a plunger having a forwardly extending plunger head insertable into the body through the second open end behind the needle retraction mechanism, and a needle extending forwardly of the first open end, wherein:

the body comprises a nose adjacent to the first ~~opening~~ open end, a barrel adjacent to the second ~~opening~~ open end, and a transition zone between the nose and barrel;

the needle retraction mechanism is grounded inside the nose and comprises an elongated needle holder and a spring;

the elongated needle holder further comprises a needle holding portion secured in fixed relation to the needle, a reduced diameter portion at one end of the needle holding portion, the reduced diameter portion extending forwardly through the first open end; a head at another end of the needle holding portion opposite the reduced diameter portion; a fluid path extending longitudinally through the needle holder in fluid communication with the needle and with a variable fluid chamber inside the body

between the needle holder and the plunger; and a retainer member having a first annular surface slidably engaging the needle holder head and a second annular surface slidably engaging the inside wall of the body opposite the needle holder head; ~~and~~

the spring is confined prior to retraction inside the nose in an annulus defined by the needle holding portion and a portion of the inside wall opposite the needle holding portion;

the plunger head has a tip aligned to abut against the retainer member and slide the retainer member longitudinally out of engagement with the needle holder head during retraction; and

the plunger comprises a retraction cavity into which part of the retraction mechanism is received during retraction to withdraw the needle into the body through the first ~~opening~~ open end.

59. (previously presented): The syringe of claim 58 wherein the inside diameter of the barrel is larger than the inside diameter of the nose, and the inside diameter of the transition zone tapers inwardly between the barrel and the nose.

60. (previously presented): The syringe of claim 58 further comprising an annular shoulder between the needle holding portion and the reduced diameter portion, the annular shoulder abutting against the inside wall proximal to the first open end to ground the elongated needle holder inside the nose.

61. (currently amended): The syringe of claim 58 wherein the tip of the plunger head defines ~~a third~~ an opening into the retraction cavity.

62. (currently amended): The syringe of claim 61 wherein a resilient dislodgeable stopper is positioned in the ~~third~~ opening into the retraction cavity.

63. (previously presented): The syringe of claim 62 wherein a front portion of the dislodgeable stopper extends forwardly of the tip.

64. (previously presented): The syringe of claim 58 wherein the plunger head further comprises a slidable seal contacting the inside wall of the barrel.

65. (previously presented): The syringe of claim 64 wherein the seal is mounted in a fixed axial position on the plunger.

66. (currently amended): The syringe of claim 58 wherein the plunger further comprises ~~an end cap~~ a rear end portion opposite the plunger head, and a thumb cap at the rear end portion.

67. (currently amended): The syringe of claim 66 wherein the ~~end~~ thumb cap has ~~a fourth~~ an opening.

68. (currently amended): The syringe of claim 67 wherein a ~~plug~~ closure is ~~inserted into~~ installed in the ~~fourth~~ opening and the retraction cavity is vented.

69. (currently amended): The syringe of claim 68 wherein the barrel comprises a collar adjacent to the second ~~opening~~ open end, and the ~~end~~ thumb cap fits closely inside the collar when the plunger is depressed during retraction.

70. (previously presented): The syringe of claim 69 wherein the plunger end cap is lodged in the barrel collar by pressing the plunger to cause retraction, thereby preventing subsequent withdrawal of the plunger from the barrel.

71. (previously presented): The syringe of claim 58 comprising a one-piece barrel.

72. (previously presented): The syringe of claim 58 wherein the retainer member is positioned at the most constricted portion of the transition zone where the nose begins.

73. (previously presented): The syringe of claim 58 wherein the retainer member engages the needle holder head with a holding force which exceeds a retraction force applied to the needle holder head by the spring when the spring is compressed.

74. (previously presented): The syringe of claim 58 wherein the nose comprises an annular space between the inside wall and the spring into which the retainer member is forced upon separation from the needle holder head by the plunger tip during retraction.

75. (previously presented): The syringe of claim 58 wherein the needle is inserted into the reduced diameter portion of the elongated needle holder extending forwardly of the body and is attached to the elongated needle holder.

76. (previously presented): The syringe of claim 58 wherein the inside wall of the nose functions as a spring guide during compression of the spring.

77. (previously presented): The syringe of claim 58 wherein the retainer member has an outside mating surface making a seal with the inside wall.

78. (previously presented): The syringe of claim 58 wherein at least a portion of the retraction mechanism is received into the retraction cavity during retraction.

79. (previously presented): The retraction mechanism of claim 58 wherein the retraction mechanism is releasable by forward movement of the plunger to disengage

the retainer member from the needle holder head without contact between the plunger seal element and the retainer member.

80. (previously presented): The syringe of claim 58 wherein the retainer member acts as a fluid seal for the variable fluid chamber prior to retraction.

81. (currently amended): A syringe having a hollow body with first and second open ends and an inside wall of varying inside diameter extending between the first and second open ends, a needle retraction mechanism insertable into the body, a plunger having a forwardly extending plunger head insertable into the body through the second open end, and a needle extending forwardly of the first open end, wherein:

the body comprises a nose adjacent to the first opening, a barrel adjacent to the second opening, and a transition zone between the nose and barrel;

the needle retraction mechanism is grounded inside the nose and comprises an elongated needle holder and a spring;

the elongated needle holder further comprises a needle holding portion secured in fixed relation to the needle and a head opposite the needle holding portion, the needle holding portion extending forwardly through the first open end; a fluid path extending longitudinally through the needle holder in fluid communication with the needle and with a variable fluid chamber inside the body between the needle holder and the plunger; and a retainer member holding the spring in compression inside the nose prior to retraction; ~~and~~

a forwardly extending portion of the compressed spring is confined in an annulus defined by the needle holder and a portion of the body opposite the needle holder;

the plunger head comprises a slidable barrel seal mounted in fixed axial relation to the plunger;

the plunger head abuts against the retainer member following injection and comprises an axially slidable structure that disengages the retainer member from the head of the needle holder during retraction;

the plunger comprises a retraction cavity into which part of the retraction mechanism is received during retraction to withdraw the needle into the body through the first opening; and

the plunger comprises an end cap having an outer periphery, the outer periphery being receivable into the body during retraction to prevent reuse of the syringe.

82. (previously presented): The syringe of claim 81 wherein the inside diameter of the barrel is larger than the inside diameter of the nose, and the inside diameter of the transition zone tapers inwardly between the barrel and the nose.

83. (previously presented): The syringe of claim 81 wherein the barrel comprises a collar adjacent to the second opening, and the end cap has an outer periphery that fits closely inside the collar when the plunger is depressed during retraction.

84. (previously presented): The syringe of claim 81 wherein the retainer member is positioned at the most constricted portion of the transition zone where the nose begins.

85. (previously presented): The syringe of claim 81 wherein the retainer member engages the needle holder head with a holding force which exceeds a retraction force applied to the needle holder head by the spring when the spring is compressed.

86. (previously presented): The syringe of claim 81 wherein the needle is inserted into the needle holder through a portion extending forwardly of the body.

87. (previously presented): The syringe of claim 86 wherein the needle is attached to the needle holder.

88. (previously presented): The syringe of claim 81 comprising a one-piece body.

89. (previously presented): The syringe of claim 81 wherein the inside wall of the nose functions as a spring guide during compression of the spring.

90. (previously presented): The syringe of claim 81 wherein the retainer member has an outside mating surface making a seal with the inside wall.

91. (previously presented): The syringe of claim 81 wherein at least a portion of the retraction mechanism is received into the retraction cavity during retraction.

92. (previously presented): The syringe of claim 81 wherein the retainer member acts as a fluid seal for the variable fluid chamber prior to retraction.

93. (previously presented) The syringe of claim 83 wherein the outer periphery of the plunger end cap is lodged in the barrel collar by pressing the plunger to cause retraction, thereby preventing subsequent withdrawal of the plunger from the barrel.

94. (previously presented): The syringe of claim 81 wherein the plunger comprises a tip that extends forwardly of the plunger seal to initiate retraction.

95. (canceled)

96. (previously presented): A syringe assembly having a hollow body with an inside wall, a retractable needle, a needle retraction assembly seated inside the body and a plunger slidably engaging a portion of the inside wall,

the retraction assembly comprising a compressible spring, a needle holder and a

retainer member continuously surrounding the needle holder to hold the spring in compression prior to retraction, the inside wall and needle holder cooperating as a spring guide during compression of the spring,

the plunger comprising a handle with a longitudinally extending retraction cavity having a first inside diameter and a forwardly extending tip having a second inside diameter less than the first inside diameter, the tip defining an opening through which the needle holder is receivable into the retraction cavity during retraction; a seal disposed in fixed longitudinal relation to the plunger handle and in sliding engagement with the inside wall of the body,

the body further comprising a rigid plunger seal stop surface which acts as a plunger seal stop to limit forward movement of the plunger inside the body.

Claims 97 – 101 **(Canceled)**